WHAT IS CLAIMED IS:

1. An orthosis comprising:

a first support portion that fits around a first body portion on a first side of a patient's joint;

a second support portion that fits around a second body portion, the second body portion being on the opposite side of the joint from the first body portion;

a hinge connecting the first support portion and the second support portion; and

a resistance applicator connected to the hinge to provide resistance to rotation of the hinge, the resistance applicator comprising:

a first surface;

a second surface generally parallel to the first surface and selectively movable relative to the first surface;

a crank that is located between the first surface and second surface and that is rotatable relative the first surface; and

a compression unit located between the first surface and the second surface, the compression unit applying resistance with respect to the rotation of the crank relative to the first surface with the amount of resistance being related to the distance of the first surface to the second surface.

2. The orthosis of claim 1 wherein the compression unit comprises a plurality of crank rings interspersed with and in frictional contact with a plurality of housing rings, where the crank rings rotate with the crank and the housing rings rotate with the first surface.

3. The orthosis of claim 1 wherein the tension within the compression unit is varied by the rotation of a knob, which alters the distance between the first surface and the second surface.

4. The orthosis of claim 1 wherein the resistance applicator is reversibly attached to the hinge with a lock pin.

5. The orthosis of claim 1 wherein the resistance applicator comprises a spring between the first surface and the second surface.

6. The orthosis of claim 1 wherein the hinge comprises selectable end stops delimiting the rotational range of the hinge.

7. The orthosis of claim 1 wherein the resistance applicator provides rotational resistance the varies with the orientation of the hinge.

8. An orthosis comprising:

a first support portion that fits around a first body portion on a first side of a patient's joint;

a second support portion that fits around a second body portion, the second body portion being on the opposite side of the joint from the first body portion;

a hinge connecting the first support portion and the second support portion; and

a resistance applicator applying selective resistance to rotation about the hinge;

a strain sensor operably connected to the first support portion; and

a controller calibrated to measure the force applied to rotate the hinge using the electrical resistance of the strain sensor.

9. The orthosis of claim 8 wherein the rotational resistance of the resistance applicator is controlled electronically.

10. The orthosis of claim 8 wherein the rotational resistance of the resistance applicator is controlled manually.

11. The orthosis of claim 8 wherein the strain sensor is connected to a summing amplifier that is biased with a reference voltage to establish the output of the amplifier within a desired range, the output of the summing amplifier is directed to the controller.

12. The orthosis of claim 8 wherein the hinge comprises a position sensor that provides an output relating to the orientation of the hinge.

13. The orthosis of claim 12 wherein the controller comprises a digital microprocessor and the orthosis further comprising a display operably connected to the microprocessor, the display shows the motion of a cursor in two dimension where the position in respective dimensions correspond to values of the strain sensor and the position sensor.

14. The orthosis of claim 8 wherein the controller comprises a digital microprocessor.

15. A method of performing closed chain exercises, the method comprising:

applying force against a force transducer with a repetition rate and force target specified with a digital microprocessor-

based portable controller, the force transducer being held fixed in space by forces external to the patient;

measuring the force applied to the force transducer using the controller, the controller being connected to the force transducer; and

displaying the force applied to the force transducer.

16. The method of claim 15 wherein the force transducer is an instrumented scale.

17. The method of claim 15 further comprising applying a force to a second force transducer using a separate body portion.

18. The method of claim 15 wherein the force transducer is a pad sensor placed against an immovable surface.

19. The method of claim 15 further comprising orienting a joint at a selected angle to perform static closed chain exercises.

20. The method of claim 15 further comprising adjusting the angle of a joint during the application of force to perform dynamic closed chain exercises.

21. The method of claim 20 wherein the display shows a target that can be reached by the application of a target force.

22. The method of claim 20 wherein the display shows a target that can be reached by flexing the joint to a target angle.

23. The method of claim 20 wherein the orientation of the joint angle is monitored with a display connected to an instrumented orthosis and wherein the display further shows the magnitude of the applied force, the

orientation and magnitude of force are displayed with the two dimensional motion of a cursor.

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24. A method of performing coordination exercises for neuromotor training comprising:

flexing a first joint such that a cursor on a display moves to reach a target position on the display at a selected, prescribed time, the motion of the cursor being correlated with the motion or strain of the joint by way of a sensor in an orthosis placed at the joint.

25. The method of claim 24 wherein the orthosis comprises:

a first support portion that fits around a first body portion on a first side of the joint;

a second support portion that fits around a second body portion, the second body portion being on the opposite side of the joint from the first body portion;

a flexible connection connecting the first support portion and the second support portion;

a position sensor operably connected to the flexible connection such that the position sensor detects the relative orientation of the first support portions with respect to the second support portion.

26. The method of claim 24 wherein the sensor is operably connected to a portable controller comprising a digital microprocessor.

27. The method of claim 24 wherein the cursor motion is correlated with the strain of a joint by way of a strain sensor.

28. The method of claim 24 wherein the cursor moves in two dimensions with the motion in one dimension corresponding to output of a position sensor and motion in the other dimension corresponding to output of a strain sensor.

29. The method of claim 24 further comprising flexing a second joint to simultaneously vary the display along with motion of the first joint, wherein variations in the display due to motion of the second joint is determined by the output of a position or strain sensor at the second joint.

30. The method of claim 29 wherein the sensors are operably connected to a portable controller comprising a digital microprocessor, the digital microprocessor providing a target for the flexing of the first and second joint on the display.

31. The method of claim 24 wherein the sensor is selected from the group consisting of a strain sensor and a position sensor.

32. An instrumented exercise device comprising:

an elastic cord;

a transducer connected to the elastic cord such that forces applied to the cord alter output from the transducer; and

an display operably connected to the transducer.

33. The instrumented exercise device of claim 32 comprising a handle connected to the cord.

34. The instrumented exercise device of claim 32 comprising a cuff that secures around a body portion, the cuff being attached to the cord.

35. The instrumented exercise device of claim 32 wherein the cord comprises an elastic band or an elastic tube.

36. The instrumented exercise device of claim 32 wherein the transducer is a strain sensor or a stretch sensor.

37. The instrumented exercise device of claim 32 further comprising a digital microprocessor operably connected to the transducer and to the display.

38. The instrumented exercise device of claim 37 wherein the microprocessor is programmed to display information regarding a completed exercise routine.

39. The instrumented exercise device of claim 37 wherein the microprocessor comprises an output device selected from the group consisting of a serial connection, a modem, a radio transmitter, an infrared transmitter and a telephone connection.

40. An instrumented exercise device comprising:

a frame comprising two lever arms connected at a joint;

a transducer connected to the frame such that torsional forces applied against the frame are measured by the transducer; and

a display operably connected to the transducer.

41. The instrumented exercise device of claim 40 wherein the joint comprises a hinge.

42. The instrumented exercise device of claim 41 wherein the hinge has an adjustable resistance.

43. The instrumented exercise device of claim 40 further comprising a spring attached to the lever arms such that movement of the lever arms compresses the spring.

44. The instrumented exercise device of claim 40 wherein the transducer comprises a strain sensor.

45. The instrumented exercise device of claim 44 wherein the output of the strain sensor is correlated with applied forces.

46. The instrumented exercise device of claim 40 wherein the transducer comprises a position sensor connected to the hinge such that the output of the position sensor is related to the orientation of the hinge.

47. The instrumented exercise device of claim 40 comprising a cuff that attaches to a body part, in which the cuff is attached to a lever arm.

48. The instrumented exercise device of claim 40 further comprising a digital microprocessor connected to the transducer and the display.

49. The instrumented exercise device of claim 48 wherein the microprocessor comprises an output device selected from the group consisting of a serial connection, a modem, a radio transmitter, an infrared transmitter and a telephone connection.

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